The primary contact for all trouble reporting, status and updates will be the Colorado Information and Technology Services (CITS) Help Desk located at 690 Kipling, Lakewood, Colorado.

## 3.4.2 Network Operations Center (NOC)

**3.4.2.1 Requirement: The Offeror shall provide a 24x7x365 Network Operations Center that will provide constant monitoring and network management support services in all areas of network management as defined by the Open Systems Initiative (OSI) Integrated Network Management Model and the technical requirements defined in this RFP document.**

**3.4.2.2 Requirement: The Offeror shall provide a 1-800 support number with a maximum hold time of 5 minutes.**

**3.4.2.3 Requirement: The Network Operations Center shall have a dedicated technical support team assigned to support the State's network with an understanding of the design and configuration of the State's network.**

**3.4.2.4 Requirement: This offering shall have defined problem severity definitions and escalation procedures that specifies NOC maximum response time, NOC maximum repair time, and the escalation procedures for taking the problem from one level to another. The MNT offering shall have a defined post-mortem review process for major outages. Service Level Agreements, as requested in Section 3.4.8, shall include fault/problem response specifications.**

**3.4.2.5 Requirement: The Offeror shall describe their proposed problem identification, isolation, and resolution process.**

**3.4.2.6 Requirement: The Offeror shall describe the proposed problem escalation procedures that specifies NOC maximum response time, NOC maximum repair time, and those factors that will trigger problem escalation.**

## 3.4.3 Fault Management

Fault/problem management is a process within network operations responsible for applying proven and consistent analytical approaches to network problem determination, isolation, and resolution. Its primary objective is to minimize network interruptions that would negatively impact service levels to the end user.

Proposals shall include detail of how the contractor will interact and communicate with the Colorado Information Technology Services help desk to notify, track and resolve problems. Offeror shall supply the State a direct or web-based interface to Offeror owned monitoring and management tools for real-time reporting, tracking, status and updates. Access is required for both Telecommunications Services at 2452 W. 2nd Avenue and the CITS Help Desk at 690 Kipling.

**3.4.3.1 Requirement: The Offeror shall describe how real-time interfacing to the CITS help desk will occur.**

**3.4.3.2 Requirement: The MNT outsourced network management service offering shall have a defined reporting system to track problem volumes, patterns and trends. It shall have reporting capabilities to verify and analyze each month's service level agreement's conformance as proposed by the Offeror in Section 3.4.8.**

**3.4.3.3 Requirement: The Offeror shall provide monthly reporting capabilities and formats that they will provide for fault management monitoring and conformance.**

**3.4.3.4 Requirement: The Offeror shall provide an organizational chart depicting their technical support infrastructure and specify the number of full-time and part-time resources that will be dedicated to the MNT wide area network infrastructure during all Shifts.**


**3.4.4 Performance Management**
Network Capacity and Performance management shall be a functional area within the Multi-Use Network service provider's overall network management service offering. Performance management is focused on capturing and analyzing network component utilization data to provide a basis for network optimization and capacity planning. Periodic performance reports (frequency to be determined at contract) will be provided to the State MNT staff on an ongoing basis. The Network Management process shall include a methodology for continuous performance optimization as well as periodic review and upgrading of capacity to ensure peak demand availability. Offerors shall provide a performance management capability that is proactive, not reactive. Elements of performance management shall include:

> Network Response Time
> Throughput
> Utilization
> Analysis and Tuning
> Capacity Planning
> Reporting
> Service Level Agreements

**3.4.4.1 Requirement: The Offeror shall describe how their service offerings will address the area of performance management.**


**3.4.5 Configuration Management**
Configuration management is the process within Network Operations responsible for maintaining a database of technical information on all network components and site

connections to the Multi-Use Network infrastructure. Moves, Adds, and Changes for Multi-Use Network site connections must be part of the overall Configuration Management service offering. The State MNT technical staff at Network Services shall act as consultants to all MNT participants, providing engineering on network usage and capabilities according to customer needs and requirements. The State MNT technical staff shall provide all specifications for configurations of and technologies used on the State owned Edge switches. The Offeror shall provide staff dedicated to the State network to support such Adds, Moves and Changes as specified by the State MNT technical staff for all MNT connections and configurations as well as outsourced management of State owned Edge switches and other devices.

In addition, configuration information is necessary to support the Fault/Problem management functions of the Network Operations Center during problem identification and resolution.

**3.4.5.1 Requirement: The Offeror shall propose a method of communication and database maintenance to provide up-to-date management information to CITS.**

**3.4.5.2 Requirement: The Offeror shall describe how their service offerings will address the area of configuration management.**

### 3.4.6 Security Management

Network Security management is the process within Network Operations that implements and enforces Multi-Use Network security policies and procedures to protect the State users of the network infrastructure from unauthorized access. The Multi-Use Network service provider's on-going security management service and practice shall include internal security audits, verification testing, and monitoring to accommodate the security requirements of the Multi-Use Network.

## Network Security Best Practices

**3.4.6.1 Requirement: The Offeror shall implement and enforce industry best practice WAN infrastructure security policies and procedures to protect the MNT network and its users from unauthorized access.**

**3.4.6.2 Requirement: For the purposes of this RFP, the Offeror shall identify and detail in their response which industry security standards they will implement and how their implementation reflects what they understand to be industry best practices.**

**3.4.6.3 Requirement: The Offeror's response shall also include a description of current offerings and plans for introduction of emerging security standards for enhanced EDI and e-commerce security requirements.**

### 3.4.7 Administrative Management

Administrative/Cost Management is an ongoing function within Network Operations with two functions. The first is the monitoring and control of the cost of the network, for both capital and operating expenses, including a requirement for an integrated order processing and tracking system into the State's current systems and a web-based real time monitoring and tracking system with reporting capabilities. The Offeror shall supply a means to electronically provide invoices, in addition to hard copies, that can be processed by a State system. The intent of the State is to move toward such automation through EDI. The Offeror shall work with the State to define the requirements and establish the processing system. Regular and web-based real-time monitoring and reporting requirements—aggregate and client/site specific—will need to be mutually defined and established.

**3.4.7.1 Requirement: The Offeror shall describe their order processing and tracking capabilities.**

**3.4.7.2 Requirement: The Offeror shall describe their capabilities for electronic billing and integration.**

**3.4.7.3 Requirement: The Offeror shall describe their current EDI capabilities and any technical format requirements.**

The second function of Administrative/Cost Management is an MNT business offering that will require the establishment of a process for consolidating thousands of State contracts for services into a more simplified business model for determination of what is being delivered to the Multi-Use Network end user community. The goal is demonstrable efficiencies of cost and value gained.

### 3.4.8 Service Level Agreements (SLAs)

Service level agreements and Offeror performance commitments are mandatory requirements in this RFP. The Offeror must generate monthly network management reports and provide real time network management data to the State of Colorado Telecommunications Services Office. These reports and data will be used for the purpose of monitoring and verifying Offeror compliance with the service level agreements (SLAs) and commitments defined as a result of this RFP document.

**3.4.8.1 Requirement: The Offeror must state all other SLA parameters/commitments they are willing to provide with the proposed solution. This must include such commitments as minor / major / critical failure Mean Time To Repair (MTTR) and all other pertinent SLA parameters. (M)**

**3.4.8.2 Requirement: The Offeror must work closely with State Multi-Use Network management staff to develop and provide monthly network management reports for Fault Management, Performance Management, Configuration Management, and**

**Security Management. These reports will be used to analyze and verify Offeror conformance with the resulting defined service level agreement requirements. (M)**

**Note:** The following SLA definitions call for monitoring, reporting, and review processes for identification of failures and payment of penalties. To the extent that it is possible, the Offeror may propose to combine these oversight processes into a single monthly management review. The State encourages Offerors to propose processes that provide such efficiencies.

### 3.4.8.3 Network Availability SLA

Network availability is the amount of time that the MNT wide area network service is actually available for use by an End Site location. A robust network infrastructure that incorporates redundancy at the core backbone and Level 1 SANAP and ANAP locations can help guarantee a high level of network availability. For purposes of this technical requirements definition, network availability values will be defined for each of the three levels of the MNT wide area network infrastructure's hierarchical topology.

### 3.4.8.3.1 Technical Requirements

The following defines the monthly SLA commitment for 24 x 7 x 365 network availability at different levels in the Multi-Use Network wide area infrastructure.

**Level 1 - Requirement: Connectivity from the MNT core backbone network infrastructure to the following Super ANAPs (SANAPs):**
> **690 Kipling, Lakewood, CO**
> **1525 Sherman, Denver, CO**
> **4201 E. Arkansas, Denver, CO**
> **1200 Larimer St., Denver, CO**

**must have a minimum monthly network availability factor of 99.97% per calendar month per SANAP. (This network availability percentage shall be greater if so specified by the Offeror.) The MNT service provider shall be entitled to no greater than 2 hours of scheduled downtime (in non-business hours) for any these sites per quarter or 3-month period. Scheduled downtime must be coordinated with the MNT staff with at least 14-days advance notice prior to performing the downtime in order for it not to be calculated into the network availability factor. Scheduled downtime must occur during off-hours. (M)**

**Level 2 - Requirement: Connectivity from all other MNT ANAPs in the core backbone network infrastructure to the geographically dispersed state-owned points of high user demand must have a minimum monthly network availability factor of 99.86% (60 min) per ANAP per calendar month (This network availability percentage will be greater if so specified by the Offeror.) The MNT Service Provider will be entitled to no greater than 4 hours of scheduled downtime for each Level 2 ANAP per quarter or 3-month period.**

**Scheduled downtime must be coordinated with the MNT staff with at least 14-days advance notice prior to performing the downtime in order for it not to be calculated into the network availability factor. Scheduled downtime must occur during off-hours. (M)**

**Level 3 – Requirement: Connectivity from the MNT ANAPs in the core backbone network infrastructure or State-owned ANAP locations to MNT End sites shall have a minimum monthly network availability factor of 99.72% per site, per month (2 hours)(This network availability percentage will be greater if so specified by the Offeror) The MNT Service Provider shall be entitled to no greater than 4 hours of scheduled downtime for each Level 3 End Site per quarter or 3-month period. Scheduled downtime must be coordinated with the MNT staff with at least 14-days advance notice prior to performing the downtime in order for it not to be calculated into the network availability factor. Scheduled downtime must be scheduled during off-hours.**

**3.4.8.3.1.1 Requirement: The above specified network availability factors must be calculated at the end of each calendar month according to State parameters (the percentages of availability shown above) and methods that the Offeror must propose in response to the Performance management monthly report requirements of this RFP. The Offeror must provide a brief description of their proposed methodology in their proposal. (M)**

## 3.5 Project Management

The State of Colorado acknowledges that project management and implementation procedures will require alignment and adjustment of work processes for both the State MNT project organization and the Offeror's organization. This initial alignment will be part of the contract negotiation. However, the Offeror shall respond to the following responsibility requirements with proposed processes. The Offeror also shall describe any standard processes it already has developed for other client projects of similar scope which may be applied to the requirements of this RFP.

Project Management responsibilities of the State and Offeror follow:

### 3.5.1 State MNT Staff General Responsibilities

State of Colorado MNT management staff shall

1. Provide overall project direction and management

2. Review and approve all project plans and deliverables

3. Ensure that technical assistance and support are provided during the MNT Service Provider's implementation phases and ongoing upgrade design for of this project

4. Establish project organization by meeting with the MNT Service Provider's project management team to finalize and document areas of responsibility, personnel reporting relationships and administrative procedures

5. Establish evaluation mechanisms by setting up procedures for day-to-day control of the project

6. Finalize all project specific documentation standards and requirements for the various types of reports, technical/procedural documentation, and management materials that will be produced during the project. These standards will ensure consistency of approach and sufficiency of content

7. Coordinate other resources as needed to support the MNT implementation process

8. Provide on-site assistance on an as needed basis during the implementation phases of the project

### 3.5.2 Offeror Project Management Responsibilities

The following responsibilities are Project Management requirements of the Offeror. The Offeror shall describe in their RFP response how these responsibilities will be met:

**3.5.2.1 Requirement: Offeror shall identify project milestones/deliverables and provide a preliminary schedule for when these targets will be met/delivered.**

**3.5.2.2  Requirement:  Offeror shall propose and describe the anticipated use of a Project Management tracking/planning software application, including in their proposal some methodology for online or shared access with MNT management.**

**3.5.2.3  Requirement:  Offeror shall propose a meeting/communication routine which identifies weekly, monthly, and on-demand options for management communication**

**3.5.2.4  Requirement:  Offeror shall Submit Phase I implementation plan as part of RFP Response, containing detailed information on ANAP/SANAP sites to be completed in first year of implementation.**

**3.5.2.5  Requirement:  Offeror shall submit proposed network acceptance test plans for end site implementations, ANAPs, and SANAPs.**

**3.5.2.6  Requirement:  Offeror shall propose a mediation process for implementation project changes or variances**

**3.5.2.7  Requirement:  Offeror shall submit Phase II Plan at month 6 of implementation, containing detailed information on ANAP/SANAP sites to be completed in second year of implementation.**

**3.5.2.8  Requirement:  Offeror shall submit Phase III Plan at month 18 of implementation, containing detailed information on ANAP sites to be completed in third and final year of implementation.**

## 3.6 Cost

**Evaluation** - The expected cost to the State during the entire basic period, including all options, will be evaluated. Offerors are expected to develop cost schedules based on the service requirements and phased implementation requirements detailed in this RFP. Offeror should use the volumes and site addresses specified in Attachment 5.4. Offeror's should assume that telecommunications traffic volumes will be split evenly between UBR and CBR services. The cost information supplied must reflect the full cost to the State of solutions proposed by the Offeror. The Offeror's response must differentiate between tariffed and non-tariffed services. Proposed services should be presented in catalog format with pricing schedules by service. The cost schedules must reflect the Offeror's implementation strategy for completing service requirements to the requisite minimum number of ANAP/SANAP sites in each year of the planned implementation, but is not limited to that minimum. The cost proposal should be presented in the following format:

**3.6.1 Requirement: The catalog of services offered for network services.**

**3.6.2 Requirement: The catalog of services offered for management and monitoring services including optional costs for management and monitoring of agency end-site equipment.**

**3.6.3 Requirement: Year 1,2 and 3 network services costs, including installation and any start-up costs for all State sites connecting to completed ANAPs.**

**3.6.4 Requirement: Network Services Annual recurring costs - ongoing operating costs after the completion of the implementation (years 4-10).**

**3.6.5 Requirement: Year 1,2 and 3 management and monitoring costs, including consoles, software implementation, and startup costs for remote monitoring.**

**3.6.6 Requirement: Annual recurring costs - ongoing operating costs for network management and monitoring after the completion of the implementation (years 4-10).**

**3.6.7 Requirement: Summary costs - a summary of the total costs by year (3.6.3 through 3.6.6) of operating the MNT over the ten years of the contract (five year basic period, plus five one year extensions) including a total of all years.**

## Section 4 - Proposal Format / Evaluation Criteria

### 4.0 General Information

**4.1 Sections / Possible Scores** - The Multi-Use Network Proposal Evaluation will be evaluated and scored in five sections with a total point value of 1200:

| Section | Possible Score |
|---|---|
| Offeror Qualifications / Experience | 100 |
| Technical Requirements | 400 |
| Management and Monitoring | 200 |
| Project Management | 100 |
| Cost | 400 |

### 4.1.1 Proposal Evaluation Process

The MNT evaluation committee will review and score submitted proposals to determine which best meet RFP requirements, require only limited clarification; demonstrate a sound approach; show good understanding of the requirements; have adequate qualified personnel and past experience, finances, and resources to successfully complete the project; and pose no more than low risk of technical / schedule failure to the State.

**The State reserves the right to award on receipt of initial proposals.** If award is not made upon receipt of initial proposals, the State will provide Offerors remaining in the competitive range with written requests for clarifications/notice of deficiencies in their proposals. Offerors will be provided a date at which oral presentations will be heard. Oral presentations are planned to be two hours in duration. The presentation shall consist of an Offeror briefing concerning its technical approach and must also address clarifications and deficiency items identified by the State which may lead to discussions. Guidelines regarding the oral presentations will be distributed to those Offerors remaining in the competitive range.;

Offerors will be given an opportunity, after the conclusion of the oral presentations, to submit a best and final offer (BAFO). Offerors will be informed in writing of the date by which best and final offers are due. Offerors shall make any revisions the State deems necessary to clarify or correct weaknesses in their proposal. Revisions shall be made by "change page" to proposals, including pricing. The State does not require complete, substantial proposal rewrites. Offerors are cautioned not to make changes in the technical approach or make price/cost revisions that are not clearly explained and/or justified in any proposal revision. Offerors assume the risk that proposed revisions are adequately explained so the State understands the nature of the revisions and the risk to the State from unreasonable forecasts of contractor costs.

This information shall include the most recent audited financial statement or a banking reference and a credit rating by a rating service.

*Response (limit 4 pages; refer to attachment):*

## 4.2.2  Experience

**Requirement:  Proposals shall provide the following information to support the Offeror's experience in delivering services such as those sought under this RFP:**

**4.2.2.1  A brief description of how long the Offeror has been performing the services sought under this RFP.**

**4.2.2.2  Two lists of key personnel, one for key staff whose responsibilities will be primarily implementation (Project Management) and a second for key management and maintenance staff whose responsibilities will be ongoing for the duration of the contract.  These lists shall include definitions of the level of responsibility and involvement for each person, and brief descriptions which should include each individual's title, education, and employment history.  These lists shall also identify key Sub-Contractor personnel.**

*Response(limit 4 pages; refer to attachment):*

**4.2  Offeror Qualifications / Experience  (100 Points)**

**4.2.1  Qualifications**

**For the purposes of this RFP, the State of Colorado DOP requires the Offeror to:**

**4.2.1.1  Requirement:  Provide a brief narrative description of your organization's qualifications to deliver the services sought in this RFP.  This narrative must cover the following topics:**

> **4.2.1.1.1  Requirement:  Experience or participation in planning, designing, implementing, and operating a network infrastructure of similar scope to the one sought in this RFP.**
>
> **4.2.1.1.2  Requirement:  Experience with wide area network migration and implementation for Projects of similar size to the Multi-Use Network where aggregation of a diverse network infrastructure into a new, state-of-the-art wide area infrastructure was required.**
>
> **4.2.1.1.3  Requirement:  The Offeror's or proposed sub-contractor's previous experience staffing and operating a 24x7x365 Network Operations Center (NOC).**
>
> **4.2.1.1.4  Requirement:  The Offeror's or proposed sub-contractor's previous experience providing outsourced network management services for a wide area network similar in size and scope to what is sought in this RFP in the following areas of OSI Network Management:  Fault Management; performance management; configuration management; capacity management; and account management.**

**4.2.1.2  Requirement:  Provide a description of your organization's background and organizational history, including:**

> **4.2.1.2.1  Years in business;**
> **4.2.1.2.2  Location of offices;  and,**
> **4.2.1.2.3  Form of business (corporation, partnership, joint venture, LLC, etc.)**
> **4.2.1.2.4  A description of the offering organization's size and client base.**

**4.2.1.3** Upon Notice of Intent to Award,  the Prime Contractor shall supply documentation of financial responsibility, financial stability, and sufficient financial resources to provide the services sought in this RFP, within the required time frames. This response must include:

> 4.2.1.3.1  Other financial information by which the State may reasonably formulate an opinion about the relative stability and financial strength of the Prime Contractor.

4.3.2.2 Requirement: The MNT high-speed communication links to the ANAPs and end sites must be based on industry accepted standards from the following groups: ATM Forum, IETF, ITU, IEEE, Bellcore and ANSI. (M)
*Response:*

**4.3.2.3 Requirement: The MNT network "cloud" must be based on ATM technology. (M)**
*Response:*

**4.3.2.4 Requirement: Emerging Standards – Where unpublished standards are used in this specification, a "grace period" of 12 months from adoption is given wherein the Offeror and their chosen manufacturers will be automatically exempted from compliance. Policy, guidelines and process for case-by-case consideration of waiver in these situations are described in Attachment 5.6.**
*Response:*

**4.3.2.5 Requirement: ATM switching capabilities must support all current standards, features and options on which these requirements are based. (M)**
*Response:*

**4.3.2.6 Requirement: All future ATM Forum standards, features and options on which these requirements are based shall be supported within 12 months of ratification by the ATM Forum.**
*Response:*

**4.3.2.7 Requirement: The Offeror shall specify what the minimum parameters for voice communications, video communications and hi-priority, interactive data and video communications shall be for the following:**

- **Throughput**
- **Delay**
- **Jitter**
- **Packet Loss/Dropped Packets**
- **Cell Loss Ratio**

*Response:*

**4.3.2.8 Requirement: Accurate timing, traceable to a Stratum I source, must be available at the Offeror's interface to all State ANAP, SANAP, and Edge Site locations. (M)**
*Response:*

**4.3.2.9 Requirement: The Offeror must be able to provide incremental and variable bandwidth allocations on a per Mb basis. Describe your bandwidth offering. (M)**
*Response:*

## 4.3 Technical Approach / Requirements (400 Points)

*Where requested, Offeror must supply descriptive information or statements of willingness to provide a service or respond to a specific standard. The Offeror must describe how the proposed system will fulfill the given requirements or how an alternative to the requirement will meet the State of Colorado's needs. These responses shall be supplied after each stated requirement, where applicable. Note that alternate responses should be described in a brief narrative response immediately below the stated requirement.*

### 4.3.1 MNT Backbone Infrastructure

**4.3.1.1 Requirement: Provide a detailed description of the technical approach that will be used to deliver a single MNT "cloud" based on ATM technology to all counties in the state.**

**4.3.1.2 Requirement: Provide a high-level diagram indicating any redundant and diverse paths used for MNT backbone survivability. Show all ANAP locations provided by the Offeror and any State owned facilities where co-location is deemed required. Provide bandwidth provisioning between all ANAPs. Indicate and list locations served by, and names of, all companies and partnerships involved in the backbone delivery of services.**
*Response (refer to attachment):*

**4.3.1.3 Requirement: Address how the proposed technical approach will minimize punitive costs due to such factors as distance and LATA boundaries.**
Response (limit 6 pages, including any illustrations):

4.3.1.4 Requirement: A capacity planning process is critical throughout the life cycle of the network. Describe your technique for such implementation and your ability to adapt to State business needs in order to maintain future growth.

*Response (limit one half page):*

### 4.3.2 ANAP and SANAP Connectivity and Bandwidth Requirements and Service Offerings

4.3.2.1 Requirement: Describe how ANAP and SANAP extension into the "cloud" and their connectivity and bandwidth requirements will be addressed. Include related issues, such as collocation of facilities and ANAP equipment specifications, as well as interconnection to the backbone.

*Response (limit two pages):*

4.3.2.19 Requirement: The Offeror shall implement Multi-Protocol Switching (MPLS), upon expected completion of standards. This will allow transport of IP over ATM with the Quality of Service (QOS) required by State applications, reducing latency and increasing throughput. Respond with anticipated schedule for such implementation.

*Response:*

**4.3.2.20 Requirement: The Offeror shall implement PNNI 1.0 with upgrade to PNNI 2.0 upon completion of standards.**
*Response:*

**4.3.2.21 Requirement: For those offering dial tone capabilities from their facilities, an integration of narrowband voice and ATM (i.e. Circuit Emulation, AAL.2, etc.) must be available at ANAP locations to SANAPs, and Edge Sites from the ATM "cloud". Describe your ability to do this, what method or methods of integration you would use, and what phase of implementation the offerings would be available. (M)**
*Response:*

**4.3.2.22 Requirement: The Offeror shall provide full integration between voice (SS7 signaling) and ATM when available. Describe your ability to do this, what methods of integration you would use, and what phase of implementation the offerings would be available.**
*Response:*

**4.3.2.23 Requirement: Specify other or alternative service offerings or methods that are being considered for the MNT wide area network but are not necessarily ready through approved specifications and production implementation. Also provide an anticipated service release date if not currently ready.**
*Response:*

**4.3.2.24 Requirement: The Offerors must provide a geographic map of ANAP locations with clear detail of all service areas they each support. (i.e. counties, cities, towns, etc.) Include bandwidth capabilities and all services, advanced and otherwise, that can be provided from each ANAP to their supported locations. Describe any requirements by the Offeror for State assistance for ANAP locations. (M)**
*Response (limit 2 pages):*

**4.3.2.25 Requirement: List all switch and equipment manufacturers used in the backbone network at ANAP locations. Describe all communications equipment capabilities and their adherence to existing standards. Describe any proven interoperability tests with other manufacturer's edge switches and devices.**
*Response (limit 2 pages):*

**4.3.2.26 Requirement: The "Beanpole Bill" will result in additional opportunities for the establishment of "Local ANAPs" within the communities they service.**

**4.3.2.10 Requirement: All ATM offerings must comply to at least the ATM Forum User-Network Interface (UNI) Signaling Specification, Version 3.1 with plans to upgrade to UNI 4.0. Describe your planned schedule for upgrades. (M)**
*Response:*

**4.3.2.11 Requirement: The MNT network "cloud" must support logical network connections and paths in the form of Permanent Virtual Circuits (PVCs). (M)**
*Response:*

**4.3.2.12 Requirement: The MNT network "cloud" shall support logical network connections and paths in the form of Switched Virtual Circuits (SVCs). Describe your ability and willingness to do this. According to UNI 4.0 specification, describe the addressing structure you will use in support of SVC pt-pt calls. Show how address translations between State Customer Premise Equipment (CPE) and the public network ATM "cloud" will be handled.**
*Response:*

**4.3.2.13 Requirement: Describe parameters on which SVC billing will be based and any billing issues that may be unresolved.**
*Response:*

4.3.2.14 Requirement: The MNT network "cloud" must provide and support Circuit Emulation (CE) necessary for time sensitive applications such as voice, video, and Time Division Multiplexing (TDM) (M)
*Response:*

4.3.2.15 Requirement: ATM to Frame Relay Interworking must be provided for DS-0 and DS-1 rates throughout the entire "cloud". If Frame Relay service is not provided by the Offeror, co-location of the providing vendor's terminations must be accommodated. Because of the extensive nature of the current State Frame Relay network, this requirement is mandatory within Phase I of implementation. (M)
*Response:*

**4.3.2.16 Requirement: The MNT network "cloud" shall support logical Point-to-Multipoint connections in the form of PVCs.**
*Response:*

4.3.2.17 Requirement: The MNT network "cloud" shall support logical pt-to-Multipoint connections in the form of SVCs.
*Response:*

4.3.2.18 Requirement: The MNT network "cloud" shall support Inverse Multiplexing over ATM (IMA)
*Response:*

**4.4.5 Requirement: Available Bit Rate (ABR) -- The aim of this service is to provide access to bandwidth currently not in use by other service categories to users who can adjust their transmission rate. In exchange for this cooperation by the user, the network provides a service with very low loss. ABR service does not provide bounded delay variation. Good candidates for ABR are LAN interconnection, high performance file transfers, database archival, non-time-sensitive traffic and web browsing.**
*Response:*

**4.4.6 Other considerations:**

**4.4.6.1 Cell Delay Variation (CDV)** -- CDV is essential for Constant Bit Rate (CBR) connection performance. Its value is necessary for the dimensioning of the elastic buffer required at the terminating end of the connection for absorbing the accumulated CDV, regardless of whether the network is public or private.

According to the ATM Forum's Traffic Management Specification Version 4.0, B.2.2.5, a common, maximum cell delay variation value for private, public and hybrid private/public networks is essential. As an implementation guideline, the receiver CDVT should be designed to handle the case where a connection traverses three networks, each having three switches in tandem.

**4.4.6.2 Requirement: Respond as to how you will handle this recommendation in order to guarantee Constant Bit Rate connection performance. Please describe how much CDVT the public network will tolerate before it throws cells away for all service categories, classes of service and bandwidth allocations.**
*Response:*

**4.5 ANAP / SANAP Implementation**

The installation of the required capabilities for all 70 ANAP/ SANAP locations will be over a 3-year phased implementation schedule. A table is provided for those responding to the RFP to identify which of the 70 ANAP SANAP sites they propose to provide completed services to during each phase of the MNT implementation. Higher potential scores will be placed on those locations deemed *rural* through population studies. Less weight will be given to suburban areas and even less to urban areas with higher population levels. The weighting method is also designed to reward completion of rural sites in years one and two of implementation with higher scores than can be earned by suburban or urban site completions.

The following is a schedule of requirements in each phase:

**4.5.1 Phase I - January, 2000 to December, 2000**
Completed installation of the required telecommunications capabilities to the State of Colorado's ANAP and SANAP locations, a minimum of 21 access points (30%), as listed by the Offeror for Phase I, is required. Before each site is deemed completed, testing will

**Address your ability to accommodate additional infrastructure within these communities to the MNT backbone. Describe any co-location issues that may result and your ability to accommodate them.**
*Response (limit 1 page):*

**4.3.2.27 Requirement: All MNT ANAP offerings must be Year-2000 compliant. (M)**
*Response:*

## 4.4 Traffic Management and Quality of Service (QOS) Parameters

The architecture for ATM virtual connections required by the State at the ATM layer consists of the following four service categories according to the ATM Forum Traffic Management, Version 4.0 Specification. All service categories will apply to both PVC and SVC, VCCs and VPCs. Please note that Available Bit Rate (ABR) is highly desired. All technical requirements will be based on approved standards and specifications according to the ATM Forum, IETF, ITU, IEEE, and /or ANSI.

**The required service categories are:**

**4.4.1 Requirement: Constant Bit Rate (CBR) -- Supports real-time applications requiring a fixed amount of bandwidth . Supports tightly constrained Cell Transfer Delay (CTD) and Cell Delay Variation (CDV) for applications that cannot tolerate variations in delay such as voice, constant-bit-rate video, and Circuit Emulation Service (CES). (M)**
*Response:*

**4.4.2 Requirement: Real time Variable Bit Rate (rt-VBR) – Supports time-sensitive applications which also require constrained delay and delay variation requirements but transmit at a varying rate. Such bursty, delay-variation-sensitive sources are voice and variable-bit-rate video. (M)**
*Response:*

**4.4.3 Requirement: Non real time Variable Bit Rate (nrt-VBR) -- Supports applications that have no constraints on delay and delay variation, but which have variable-rate, bursty traffic characteristics. Such applications include packet data transfers, terminal sessions, and file transfers. (M)**
*Response:*

**4.4.4 Requirement: Unspecified Bit Rate (UBR) -- This service category is a "best effort" service, which does not require tightly constrained delay and delay variation and provides no specific quality of service or guaranteed throughput. Most LANs and IP implementations provide a "best effort" service today. (M)**
*Response:*

Response Code                 Definition

    C       Proposed complies with requirement

    X       Service cannot be provided with requested time frame

    A       An alternative is recommended

Place your response code (C, X or A) within the response code column next to each requirement. Where applicable and where requested, additional information shall be supplied by the Offeror which describes the way in which the proposed system will fulfill the given requirement or how an alternative to the requirement will meet the State of Colorado's needs. The additional information shall be supplied after each statement of requirement or question, where applicable. We strongly recommend that you respond to each requirement; omitted responses will be evaluated as response codes of X (Offeror's proposal will not provide service).

The following table is a list of desired ANAP / SANAP sites for the State of Colorado Multi-Use Network. Please enter code C in the appropriate phase/year box to indicate when a site implementation will be completed, X if service cannot be provided, or A if an alternative site or off-site method of providing services is proposed. Available points (PTS column) are multiplied by 100 points if completed in Phase I (2000), multiplied by 50 points if completed in Phase II (2001), and multiplied by 25 points if completed in Phase III (2002). The formula for the ANAP tables produces a highest potential score of near 100,000, which will then be divided by 1000 (x 0.001) and then converted to a percentage of the maximum points to determine a score on a 100 point basis.

**Note:** Broomfield becomes Colorado's 64th county in 2001; ANAP implementation in Broomfield cannot take place before that year. Also note that "A" coding for alternative methods may or may not adversely affect the score for that site. "A" coded sites will be eligible for the full point value available for the site type / implementation year. However, the perceived quality of the alternative method may be determined in the evaluation process to be worth fewer points, and then be scored lower by the evaluation committee. If the Offeror proposes alternative methods for providing the required service or partial service at a site or sites, they must provide a narrative description (following the table) of the method and its proposed outcomes. This description will be used by the evaluation committee to determine scoring values for a specific proposal's "A" coded sites.

Bandwidth requirements for the 70 ANAP/SANAP locations and other detail are available in Attachment 5.4. SANAP sites are listed in the following table in **bold**:

| ANAP/SANAP SITES | | | | | | |
|---|---|---|---|---|---|---|
| | COUNTY | PTS | LOCATION | PHASE 1 $WT= x100$ | PHASE 2 $WT= x50$ | PHASE 3 $WT= x25$ | SCORE |
| 1 | ADAMS | 5 | Brighton | | | |

be performed by the vendor with verification and acceptance by the State. **The Offeror shall provide all design, project management, and equipment necessary to meet all requirements listed in Section III of this RFP.**

### 4.5.2 Phase II - January 2001 to December, 2001

Completed installation of the required telecommunications capabilities to the State of Colorado's ANAP and SANAP locations, an minimum 50% of the 70 total, as listed by the Offeror for Phase II, is required. This amounts to a total of 56 access points to be operational by the completion of Phase II. By the end of Phase II, a minimum of 80% of the required ANAP and SANAP sites shall be operational. Before each site is deemed completed, testing will be performed by the vendor with verification and acceptance by the State. **The Offeror shall provide all design, project management, and equipment necessary to meet all requirements listed in Section III of this RFP.**

### 4.5.3 Phase III - January, 2002 to December, 2002

Completed installation of the required telecommunications capabilities to the State of Colorado's ANAP and SANAP locations, the final 20% of the 70 total or remaining sites, as listed by the Offeror for Phase III, is required. This completes the 70 access points. Before each site is deemed completed, testing will be performed by the vendor with verification and acceptance by the State. **The Offeror shall provide all design, project management, and equipment necessary to meet all requirements listed in Section III of this RFP.**

## 4.5.4 ANAP / SANAP Implementation Response Instructions

To determine the score for completion of ANAP / SANAP installations to meet the State of Colorado's Multi-Use Network requirements, the following evaluation process will be used. Offeror responses placed in the response code column for each requirement will be scored by multiplying the number in the PTS (Points) column by the weight factor number for the indicated year of implementation. The point system is designed to reward early completion of ANAP service offerings in rural areas. **Note:** Completion is not defined as a physical installation, although that may be necessary, but rather as meeting the service requirements to a location, however that may be accomplished. Also note that the completion requirements for years one, two, and three are *minimums* and Offerors may propose schedules which exceed the minimums in years one and two. In such a case, year three would then require only completion of any remaining ANAP / SANAP sites of the 70 designated.

The Offeror shall use **only** the codes below in responding to each requirement in this section.

| 48 | MOFFAT | 25 | Craig | | | | |
|----|--------|----|-------|---|---|---|---|
| 49 | MONTEZUMA | 25 | Cortez | | | | |
| 50 | MONTROSE | 25 | Montrose | | | | |
| 51 | MORGAN | 25 | Ft. Morgan | | | | |
| 52 | OTERO | 25 | La Junta | | | | |
| 53 | OURAY | 25 | Ouray | | | | |
| 54 | PARK | 25 | Fairplay | | | | |
| 55 | PHILLIPS | 25 | Holyoke | | | | |
| 56 | PITKIN | 25 | Aspen | | | | |
| 57 | PROWERS | 25 | Lamar | | | | |
| 58 | PUEBLO | 10 | Pueblo, 902 Erie | | | | |
| 59 | RIO BLANCO | 25 | Meeker | | | | |
| 60 | RIO GRANDE | 25 | Del Norte | | | | |
| 61 | ROUTT | 25 | Steamboat Springs | | | | |
| 62 | SAGUACHE | 25 | Saguache | | | | |
| 63 | SAN JUAN | 25 | Silverton | | | | |
| 64 | SAN MIGUEL | 25 | Telluride | | | | |
| 65 | SEDGWICK | 25 | Julesburg | | | | |
| 66 | SUMMIT | 25 | Breckenridge | | | | |
| 67 | TELLER | 25 | Cripple Creek | | | | |
| 68 | WASHINGTON | 25 | Akron | | | | |
| 69 | WELD | 10 | Greeley | | | | |
| 70 | YUMA | 25 | Wray | | | | |
| | | | | | **Total:** | | |
| | | | | | **x .001=** | | |

If the Offeror codes any site above with an "A" for an alternative method of providing service, that alternative method shall be described here. Offerors may *attach* detailed descriptions of their proposed implementation or alternate service provision for each ANAP / SANAP location listed above. These descriptions should not exceed one half page in length for each location. Note that these descriptions are not required.

*Response (refer to attachment):*

## 4.5.5 ANAP / SANAP Implementation Detail

**4.5.5.1 Requirement: Provide a detailed, phased implementation plan and schedule of services to be provided to all ANAP locations.**
*Response (refer to attachment):*

**4.5.5.2 Requirement: Provide a detailed migration strategy for transitioning any existing State circuits, as determined by the Offeror and MNT project team upon implementation, to the MNT backbone infrastructure.**
*Response: (refer to attachment):*

| | | | | | | | |
|----|------------|----|--------------------|---|---|---|---|
| 2 | ALAMOSA | 25 | Alamosa | | | | |
| 3 | ARAPAHOE | 5 | Littleton | | | | |
| 4 | ARCHULETA | 25 | Pagosa Springs | | | | |
| 5 | BACA | 25 | Springfield | | | | |
| 6 | BENT | 25 | Las Animas | | | | |
| 7 | BOULDER | 5 | Boulder | | | | |
| 8 | BROOMFIELD | 5 | Broomfield (2002) | ████████ | | | |
| 9 | CHAFFEE | 25 | Salida | | | | |
| 10 | | 25 | Buena Vista | | | | |
| 11 | CHEYENNE | 25 | Cheyenne Wells | | | | |
| 12 | CLEAR CREEK | 25 | Georgetown | | | | |
| 13 | CONEJOS | 25 | Conejos | | | | |
| 14 | COSTILLA | 25 | San Luis | | | | |
| 15 | CROWLEY | 25 | Ordway | | | | |
| 16 | CUSTER | 25 | Westcliffe | | | | |
| 17 | DELTA | 25 | Delta | | | | |
| 18 | DENVER | 5 | **1525 Sherman St.** | | | | |
| 19 | | 5 | **4201 E. Arkansas** | | | | |
| 20 | | 5 | **CU Denver** | | | | |
| 21 | DOLORES | 25 | Dove Creek | | | | |
| 22 | DOUGLAS | 10 | Castle Rock | | | | |
| 23 | EAGLE | 25 | Eagle | | | | |
| 24 | EL PASO | 5 | Colorado Springs | | | | |
| 25 | ELBERT | 25 | Kiowa | | | | |
| 26 | FREMONT | 25 | Cañon City | | | | |
| 27 | GARFIELD | 25 | Glenwood Springs | | | | |
| 28 | | 25 | Rifle | | | | |
| 29 | GILPIN | 25 | Central City | | | | |
| 30 | GRAND | 25 | Hot Sulphur Springs | | | | |
| 31 | GUNNISON | 25 | Gunnnison | | | | |
| 32 | HINSDALE | 25 | Lake City | | | | |
| 33 | HUERFANO | 25 | Walsenburg | | | | |
| 34 | JACKSON | 25 | Walden | | | | |
| 35 | JEFFERSON | 5 | Golden | | | | |
| 36 | | 5 | **690 Kipling** | | | | |
| 37 | KIOWA | 25 | Eads | | | | |
| 38 | KIT CARSON | 25 | Burlington | | | | |
| 39 | LA PLATA | 25 | Durango | | | | |
| 40 | LAKE | 25 | Leadville | | | | |
| 41 | LARIMER | 10 | Ft. Collins | | | | |
| 42 | LAS ANIMAS | 25 | Trinidad | | | | |
| 43 | LINCOLN | 25 | Hugo | | | | |
| 44 | | 25 | Limon | | | | |
| 45 | LOGAN | 25 | Sterling | | | | |
| 46 | MESA | 10 | Grand Junction | | | | |
| 47 | MINERAL | 25 | Creede | | | | |

**4.6.4.6** The State desires that Digital Subscriber Line (xDSL) be made available to MNT End Sites terminating within the "cloud"
*Response:*

**4.6.4.7** The State desires that Dial Tone shall be provided to MNT end sites terminating within the "cloud."
*Response:*

**4.6.4.8** The State desires VPN service offerings.
*Response:*

**4.6.4.9 Requirement: The Offeror shall categorize all potential End Site locations listed in Attachment 5.7 according to scheduled availability and types of service offerings.**

**4.6.4.10 Requirement: The Offeror shall specify other or alternative service offerings or methods that are being considered for the MNT wide area network.**

## 4.7 Management and Monitoring (200 Points)

The following section contains requirements that are intended to define the general monitoring and management needs of the State of Colorado for the Multi-Use Network implementation and on-going operations. This section is intended as a guideline for the Offeror and is not all-inclusive. The State is open to consideration of any additional management offerings that can be provided by the Offeror. This offering shall include both Technical and Business areas as follows:

### 4.7.1 Technical Monitoring and Management

The State of Colorado will retain ownership of all Edge ATM switches and devices terminating on the MNT backbone. Outsourced monitoring and management of this State owned equipment, and all MNT leased lines, is requested of the Offeror and includes the operations and capabilities in the following categories:

- Fault Management
- Configuration Management
- Accounting Management
- Performance Management
- Security Management

**4.7.1.1 Requirement: Indicate your ability to provide this service.**
*Response:*

**4.7.1.2 Requirement: The Offeror shall support, at a minimum, the following Network Management standards:**

**4.6 Connectivity to State Agency Sites**

A major goal of the MNT is to provide the capability of connectivity and interoperability between all State agencies through one effective "cloud." Advanced services shall ultimately be extended to such locations.

**4.6.1 Requirement: Describe your ability to provide connectivity to State Edge Sites listed in Attachment 5.4.**

**4.6.2 Requirement: Describe any local physical infrastructure and loop qualifications that could provide connectivity to State Agency End Sites (See Attachment 5.7 for State End Sites). State whether they are owned by the Offeror or that Offeror has acquired access to them through partnerships with local entities. List such partnerships, if any.**

*Response (limit two pages):*

**4.6.3 Requirement: Describe any additional or innovative methods of extended delivery of MNT infrastructure and services that will be available. Detail any problem areas and possible solutions.**
*Response:*

**4.6.4 Requirement: The State requires that the following services be made available to end sites within the MNT network "cloud":**

    **4.6.4.1 Requirement: DS0, 56kbps/64/kbps, WAN communication links must be provided to MNT end sites terminating within the "cloud." (M )**
    *Response:*

    **4.6.4.2 Requirement: DS-1, 1.544Mbps, WAN communication links must be provided to MNT ends sites terminating within the "cloud." (M )**
    *Response:*

    **4.6.4.3 Requirement: DS-3 ATM service shall be made available to MNT end sites terminating within the "cloud."**
    *Response:*

    **4.6.4.4 Requirement: Inverse Multiplexing over ATM (IMA) shall be made available to MNT end sites terminating within the "cloud."**
    *Response:*

    **4.6.4.5** The State desires that ISDN service be made available to MNT End Sites terminating within the "cloud."
    *Response:*

- **Simple Network Management Protocol (SNMP)**
- **MIBs to support specifications throughout this RFP.**

*Response:*

**4.7.1.3 Requirement: In addition to MNT Edge Sites, circuits, and devices, provide a catalog of Monitoring and Management services, in the total package from the Offeror, that could be subscribed to by other state agencies for such End Site services.**
*Response (refer to attachment):*

**4.7.1.4 Requirement: Provide all network management tools to track the network performance, monitor network status, report and track network trouble and generate management reports through their Network Operations Center (NOC). The proposed network management tools should include such features as traffic analysis, call detail recording, and reporting. Regular and web-based real-time monitoring and reporting requirements--aggregate and client/site specific--will need to be defined, established, and supported.**
*Response:*